

REMARKS

This application pertains to a novel process for preparing UV-transparent pressure-sensitive adhesives, having a UV transparency at 300 nm of more than 95%. In the process, an acrylic copolymer composition is formed having a weight average molecular weight of less than 300,000 g/mol, and from 2 to 20% by weight of a silicate filler having a maximum particle diameter of 50 nm is mixed into the copolymer composition.

Applicants have discovered that, by keeping the weight average molecular weight of the copolymer composition at less than 300,000 g/mol and the maximum particle diameter of the silicate filler at 50 nm, the UV transparency at 300 nm of the composition is more than 95% (page 1, last paragraph) and the difficulties encountered by the prior art are avoided. Specifically, in the prior art, the inclusion of fillers in the adhesives resulted in adhesives having relatively low cohesion, since the fillers reduced the transparency and interfered with UV cross-linking (see the discussion of Reference Example 3 on page 17). On the other hand, the complete absence of fillers also resulted in low cohesion of low molecular weight adhesives. See the discussion of Examples 1-4 vs. Reference Examples 1 and 2 in the paragraph following Table 1 on page 17.

The present invention overcomes the deficiencies of the prior art adhesive compositions.

Claims 1 to 9 are pending.

Claims 1-9 stand rejected under 35 U.S.C. 103(a) as obvious over Heimerl (US 5,011,492) in view of Nielsen (US 6,458,886) and Hosokawa (US 2003/0102081).

Heimerl, in Example 2, discloses a UV-cross-linkable acrylate self-adhesive composition. The molecular weight of the adhesive composition is not disclosed, and the adhesive composition does not include any filler. This reference therefore neither teaches nor suggests anything about two of the important features of Applicants' invention.

Nielson, on the other hand, is concerned with SIS type block copolymers having from e.g. 25 – 55 wt. % of water swellable hydrocolloids. The triblock copolymer has a molecular weight of 150,000 – 300,000. The compositions may include pigments, such as zinc oxide or titanium dioxide (col. 4, lines 55 et seq.). The compositions may also include fillers, such as clay, to add to the cohesion of the adhesive (col. 4, line 66). This is clearly not an acrylate composition, and is not UV cross-linkable and certainly would not be expected to be UV transparent. The Nielson compositions have absolutely nothing to do with the kinds of compositions of the Heimerl reference, and the mere fact that Nielson's compositions have a given molecular weight range suggests absolutely nothing about a molecular weight range for Heimerl's compositions. The existence of a 300,000 g/mol molecular weight SIS block copolymer would not suggest anything whatsoever to those concerned with acrylate copolymers, as the relationship of molecular weight to properties of an SIS block copolymer would be understood to be completely different than the relationship of molecular weight to properties of an acrylate.

No person skilled in the art reading Nielson would be motivated to go to Heimerl and make his molecular weight 300,000 g/mol or less! The SIS of Nielson is so different than the acrylate of Heimerl that nothing about either suggests anything about the other.

The Hosokawa reference is concerned with a process for preparing a pressure sensitive adhesive composition, wherein a monomer is mixed with an organophilic layered clay mineral, a polymerization initiator and an organic solvent; and an appropriate external action is then exerted on the mixture to intercalate part of the monomer, polymerization initiator and organic solvent into interstices of the organophilic clay material. This mixture is then subjected to solvent removal and polymerization. As a result, the clay mineral undergoes interlayer separation due to the polymer formed in the interstices of the clay mineral and hence comes to have a layer-to-layer distance of 100 Å.

Nowhere in this reference is there to be found any teaching or suggestion of an acrylate composition having a weight average molecular weight of less than 300,000 g/mol in which there is mixed 2 to 20% weight of a silicate filler having a maximum particle diameter of 50 nm. There is absolutely no discussion of the molecular weight of the adhesive compositions, and there is absolutely no discussion of the size of the filler particles.

Nowhere in this combination of references is there any guidance that could possibly lead those skilled in the art to a UV-transparent pressure sensitive adhesive made from the monomer composition recited in Applicants' claims and having a weight average molecular weight of less than 300,000 g/mol within which there is

mixed from 2 – 20% by weight of a silicate filler having a maximum particle diameter of 50 nm.

The rejection of claims 1-9 under 35 U.S.C. 103(a) as obvious over Heimerl (US 5,011,492) in view of Nielsen (US 6,458,886) and Hosokawa (US 2003/102081) is not justified, cannot be sustained, and should be withdrawn.

In view of the present remarks, it is believed that claims 1-9 are now in condition for allowance. Reconsideration of said claims by the Examiner is respectfully requested, and the allowance thereof is courteously solicited.

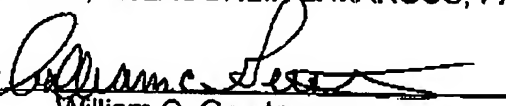
CONDITIONAL PETITION FOR EXTENSION OF TIME

If any extension of time for this response is required, Applicants request that this be considered a petition therefor. Please charge the required petition fee to Deposit Account No. 14-1263.

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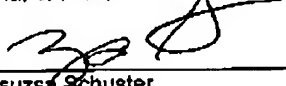
Respectfully submitted,  
NORRIS, McLAUGHLIN & MARCUS, PA

By   
William C. Gerstenzang  
Reg. No. 27,552

WCG/tmo

875 Third Avenue - 18<sup>th</sup> Floor  
New York, New York 10022  
(212) 808-0700

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By   
Zsuzsa Schuster  
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